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**PATENT ABSTRACTS OF JAPAN**(21) Application number: **11192469**(51) Intl. Cl.: **G11B 5/31 G11B 5/02 G11B**(22) Application date: **07.07.99**

<p>(30) Priority:</p> <p>(43) Date of application publication: <b>26.01.01</b></p> <p>(84) Designated contracting states:</p>	<p>(71) Applicant: <b>NEC CORP</b></p> <p>(72) Inventor: <b>ISHI TSUTOMU</b></p> <p>(74) Representative:</p>
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**MAGNETORESISTANCE  
EFFECT COMPOSITE  
HEAD, MAGNETIC  
MEMORY DEVICE  
EMPLOYING THE SAME,  
AND MANUFACTURE OF  
MAGNETORESISTANCE  
EFFECT COMPOSITE HEAD**

(57) Abstract:

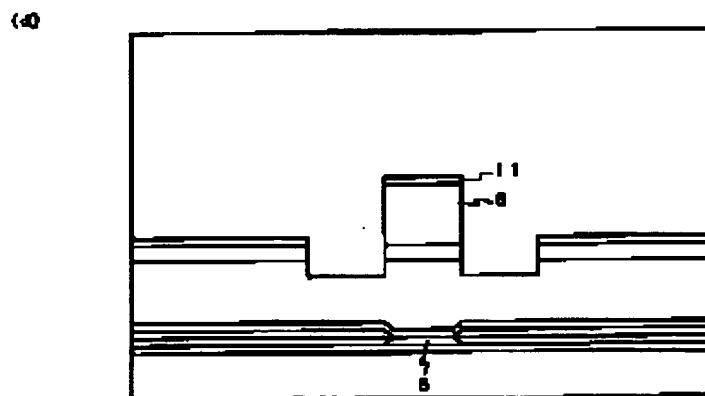
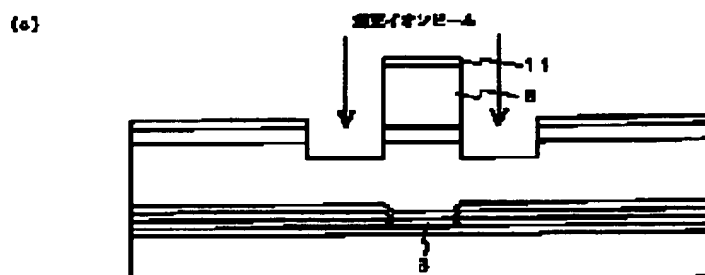
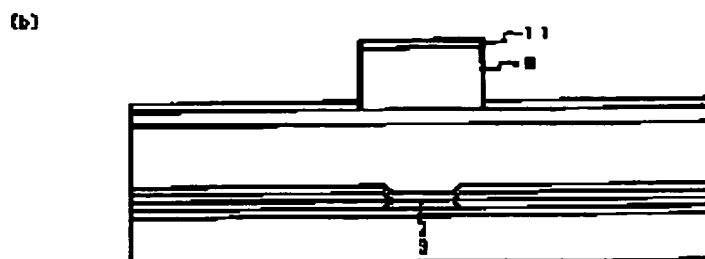
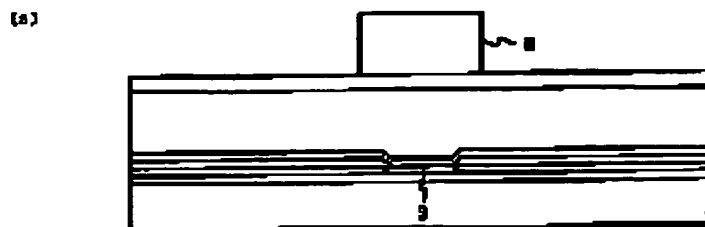
**PROBLEM TO BE SOLVED:** To obtain a magnetoresistance effect composite head which can prescribe a narrow magnetic pole with a writing width of not wider than 0.5  $\mu\text{m}$  with a necessary and sufficient machining dimension tolerance.

**SOLUTION:** The magnetoresistance effect composite head comprises a magnetoresistance effect element 3 consisting of a spin valve element, an electrode part 5 adjacent to the element 3 and supplying a sensing current and 1st and 2nd magnetic shields 1 and 6 which hold the element 3 and the electrode part 5

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between them with reading gaps 2a and 2b therebetween. The 2nd magnetic shield 6 is used as a 1st magnetic pole, and a writing magnetic gap 7, a coil (9), coil insulation parts (10a) and (10b), a 2nd magnetic pole 8 and a protective film 11 are formed on the 2nd magnetic shield 6 to compose an inductive head.

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